

AMENDMENTS TO CLAIMS

LIST OF CLAIMS

The listing of claims will replace all prior versions, and listings, of claims in the application.

---

01  
Cancel  
Claims 1-23: (Cancelled)

Claims 24 (Currently Amended): An imaging apparatus which has a lens system including a zoom lens group for changing a field angle and a focus compensation lens group having both a function of correcting a change in focal plane position upon movement of said zoom lens group and a focus adjustment function, and storage means for storing a locus that represents a positional relationship between said zoom lens group and focus compensation lens group in an in-focus state in correspondence with an object distance, and moves said zoom lens group and focus compensation lens group to trace the locus stored in said storage means upon zooming, comprising:

generation means for generating a video signal by ~~photoelectrically controlling~~  
photo-electrically converting an optical image obtained via said lens system;

~~discrimination~~ focus detecting means for ~~discriminating an in-focus level~~ detecting a focus state and a direction to drive to reach an in-focus point ~~by detecting focus states in a~~  
predetermined period from the video signal generated by said generation means ~~and~~  
~~comparing the focus states upon zooming;~~ and

determination control means for ~~determining~~ changing the period on the basis of a moving speed of said zoom lens group.

21  
Cent

Claim 25 (Currently Amended): The apparatus according to claim 24, wherein said ~~determination control~~ means divides a period of processing for detecting the focus state by the moving speed of said zoom lens group to obtain a quotient, and determines an in-focus level extracted in an extraction period n extraction periods back ( $n = \text{the quotient}$ ) as an in-focus level to be compared with the currently ~~discriminated~~ detected in-focus level.

Claim 26 (Original): The apparatus according to claim 24, wherein said lens system comprises an exchangeable lens system.

Claim 27 (Currently Amended): The apparatus according to claim 24, wherein said lens system comprises an exchangeable lens system, and said ~~determination~~ focus detecting means detects a vertical scanning period of the video signal generated by said generation means, which is mounted on an imaging apparatus main body, on the basis of television format information obtained from the imaging apparatus main body via a communication.

Claim 28 (Currently Amended): The apparatus according to claim 24, wherein said lens system comprises an exchangeable lens system, and said ~~determination~~ focus detecting means obtains a vertical scanning period of the video signal generated by said

generation means, which is mounted on an imaging apparatus main body, via a communication.

C1  
cont

Claim 29 (Original): The apparatus according to claim 24, wherein driving of said zoom lens group and focus compensation lens group is controlled by a stepping motor.

Claims 30 (Currently Amended): An imaging method for an imaging apparatus which has a lens system including a zoom lens group for changing a field angle and a focus compensation lens group having both a function of correcting a change in focal plane position upon movement of said zoom lens group and a focus adjustment function, and storage means for storing a locus that represents a positional relationship between said zoom lens group and focus compensation lens group in an in-focus state in correspondence with an object distance, and moves said zoom lens group and focus compensation lens group to trace the locus stored in said storage means upon zooming, comprising:

the generation step of generating a video signal by ~~photoelectrically~~ photo-electrically converting an optical image obtained via said lens system;

the ~~determination~~ focus detecting step of ~~discriminating an in-focus level~~ detecting a focus state and a direction to drive to reach an in-focus point ~~by detecting focus states in a predetermined period from the video signal generated in the generation step and comparing the focus steps upon zooming;~~ and

the ~~determination~~ control step of ~~determining~~ changing the period on the basis of a moving speed of said zoom lens group.

C1  
Cont

Claim 31 (Currently Amended): The method according to claim 30, wherein the ~~determination~~ control step includes the step of dividing a period of processing for detecting the focus state by the moving speed of said zoom lens group to obtain a quotient, and determining an in-focus level extracted in an extraction period n extraction periods back (n = the quotient) as an in-focus level to be compared with the currently ~~discriminated~~ detected in-focus level.

Claim 32 (Original): The method according to claim 30, wherein said lens system comprises an exchangeable lens system.

Claim 33 (Currently Amended): The method according to claim 30, wherein said lens system comprises an exchangeable lens system, and the ~~discrimination~~ focus detecting step includes the step of detecting a vertical scanning period of the video signal generated in the generation step, which is installed on an imaging apparatus main body, on the basis of television format information obtained from the imaging apparatus main body via a communication.

Claim 34 (Currently Amended): The method according to claim 30, wherein said lens system comprises an exchangeable lens system, and the ~~discrimination~~ focus detecting step includes the step of obtaining a vertical scanning period of the video signal generated in

the generation step, which is installed on an imaging apparatus main body, via a communication.

C1  
cont

Claim 35 (Original): The method according to claim 30, wherein driving of said zoom lens group and focus compensation lens group is controlled by a stepping motor.

Claims 36 (Currently Amended): A storage medium which is used in an imaging apparatus having a lens system including a zoom lens group for changing a field angle and a focus compensation lens group having both a function of correcting a change in focal plane position upon movement of said zoom lens group and a focus adjustment function, and storage means for storing a locus that represents a positional relationship between said zoom lens group and focus compensation lens group in an in-focus state in correspondence with an object distance, and which stores a program for moving said zoom lens group and focus compensation lens group to trace the locus stored in said storage means upon zooming, said program stored in said storage medium including:

a generation routine for generating a video signal by photoelectrically converting an optical image obtained via said lens system;

a ~~discrimination~~ focus detection routine for ~~discriminating an in-focus level~~ detecting a focus state and ~~s~~ a direction to drive to reach an in-focus point ~~by detecting focus states~~ in a predetermined period from the video signal generated in the generation routine ~~and comparing the focus states upon zooming~~; and

a ~~determination~~ control routine for ~~determining~~ changing the period on the basis of a moving speed of said zoom lens group.

C1  
cent

Claim 37 (Currently Amended): The medium according to claim 36, wherein the ~~determination~~ control routine includes a routine for dividing a period of processing for detecting the focus state by the moving speed of said zoom lens group to obtain a quotient, and determining an in-focus level extracted in an extraction period n extraction periods back (n = the quotient) as an in-focus level to be compared with the currently ~~discriminated~~ detected in-focus level.

Claim 38 (Original): The medium according to claim 36, wherein said lens system comprises an exchangeable lens system.

Claim 39 (Currently Amended): The medium according to claim 36, wherein said lens system comprises an exchangeable lens system, and the ~~discrimination~~ focus detection routine includes the routine for detecting a vertical scanning period of the video signal generated in the generation routine, which is installed on an imaging apparatus main body, on the basis of television format information obtained from the imaging apparatus main body via a communication.

Claim 40 (Currently Amended): The medium according to claim 36, wherein said lens system comprises an exchangeable lens system, and the ~~discrimination~~ focus detection

C1  
cont

routine includes a routine for obtaining a vertical scanning period of the video signal generated in the generation routine, which is installed on an imaging apparatus main body, via a communication.

Claim 41 (Original): The medium according to claim 36, wherein driving of said zoom lens group and focus compensation lens group is controlled by a stepping motor.

Claims 42 (Previously Presented): A lens control apparatus comprising:

- a zoom lens;
- a focus lens;
- focus detection means for detecting a focus state from a video signal in a predetermined period;
- focus control means for controlling said focus lens on the basis of an output from said focus detection means; and
- control means for changing the period on the basis of a moving speed of said zoom lens.

Claim 43 (Original): The apparatus according to claim 42, wherein said focus detection means normally detects the focus state at a period of a vertical synchronization signal, and said control means controls to prolong the period when the moving speed of said zoom lens is low.

C1  
Cont

Claims 44 (Previously Presented): A lens control method comprising:

the focus detection step of detecting a focus state from a video signal in a predetermined period in an imaging apparatus having a zoom lens and focus lens;

the focus control step of controlling said focus lens on the basis of an output from the focus detection step; and

the control step of changing the period on the basis of a moving speed of said zoom lens.

Claim 45 (Original): The method according to claim 44, wherein the focus detection step includes the step of normally detecting the focus state at a period of a vertical synchronization signal, and the control step includes the step of controlling to prolong the period when the moving speed of said zoom lens is low.

Claim 46 (Original): An imaging apparatus which has a lens system including a zoom lens group for changing a field angle and a focus compensation lens group having both a function of correcting a change in focal plane position upon movement of said zoom lens group and a focus adjustment function, and storage means for storing a locus that represents a positional relationship between said zoom lens group and focus compensation lens group in an in-focus state in correspondence with an object distance, and moves said zoom lens group and focus compensation lens group to trace the locus stored in said storage means upon zooming, comprising:



C1  
Cont

selection means for selecting the locus on the basis of positions of said zoom lens group and focus compensation lens group; detection means for detecting an in-focus level; and control means for determining a moving amount of said focus compensation lens group on the basis of the selected locus information, the in-focus level detected by said detection means upon zooming, and a moving speed of said zoom lens group.

Claim 47 (Original): The apparatus according to claim 46, wherein said control means controls the moving amount of said focus compensation lens to be inversely proportional to the in-focus level and the moving speed of said zoom lens group.

Claim 48 (Original): The apparatus according to claim 46, wherein said control means selects a new locus from the locus selected by said selection means by calculation processing.

Claim 49 (Original): The apparatus according to claim 46, wherein said control means has storage means for storing the moving amount of the focus compensation lens group corresponding to the in-focus level and the moving speed of said zoom lens group as information for selecting a new locus.

Claim 50 (Original): The apparatus according to claim 46, wherein said control means selects a new locus to change the moving amount of said focus compensation lens

group stepwise in correspondence with the in-focus level and the moving speed of said zoom lens group.

C1  
Cont

Claim 51 (Original): The apparatus according to claim 46, wherein said control means selects a new locus to change the moving amount of said focus compensation lens group continuously in correspondence with the in-focus level and the moving speed of said zoom lens group.

Claim 52 (Original): The apparatus according to claim 46, wherein said lens system comprises an exchangeable lens system, and said detection means and control means are mounted on said exchangeable lens system.

Claim 53 (Original): The apparatus according to claim 46, wherein said lens system comprises an exchangeable lens system, and said detection means and control means are mounted on an imaging apparatus main body.

Claim 54 (Original): An imaging method for an imaging apparatus which has a lens system including a zoom lens group for changing a field angle and a focus compensation lens group having both a function of correcting a change in focal plane position upon movement of said zoom lens group and a focus adjustment function, and storage means for storing a locus that represents a positional relationship between said zoom lens group and focus compensation lens group in an in-focus state in correspondence with an object

distance, and moves said zoom lens group and focus compensation lens group to trace the locus stored in said storage means upon zooming, comprising:

the selection step of selecting the locus on the basis of positions of said zoom lens group and focus compensation lens group;

the detection step of detecting an in-focus level; and

the control step of determining a moving amount of said focus compensation lens group on the basis of the selected locus information, the in-focus level detected in the detection step upon zooming, and a moving speed of said zoom lens group.

Claim 55 (Original): The method according to claim 54, wherein the control step includes the step of controlling the moving amount of said focus compensation lens to be inversely proportional to the in-focus level and the moving speed of said zoom lens group.

Claim 56 (Original): The method according to claim 54, wherein the control step includes the step of selecting a new locus from the locus selected in the selection step by calculation processing.

Claim 57 (Original): The method according to claim 54, wherein the control step has the storage step of storing the moving amount of the focus compensation lens group corresponding to the in-focus level and the moving speed of said zoom lens group as information for selecting a new locus.

21  
Cont

Claim 58 (Original): The method according to claim 54, wherein the control step includes the step of selecting a new locus to change the moving amount of said focus compensation lens group stepwise in correspondence with the in-focus level and the moving speed of said zoom lens group.

Claim 59 (Original): The method according to claim 54, wherein the control step includes the step of selecting a new locus to change the moving amount of said focus compensation lens group continuously in correspondence with the in focus level and the moving speed of said zoom lens group.

Claim 60 (Original): The method according to claim 54, wherein said lens system comprises an exchangeable lens system, and the detection step and control step are installed on said exchangeable lens system.

Claim 61 (Original): The method according to claim 54, wherein said lens system comprises an exchangeable lens system, and the detection step and control step are installed on an imaging apparatus main body.

Claim 62 (Original): A storage medium which is used in an imaging apparatus having a lens system including a zoom lens group for changing a field angle and a focus compensation lens group having both a function of correcting a change in focal plane

C1  
cont

position upon movement of said zoom lens group and a focus adjustment function, and storage means for storing a locus that represents a positional relationship between said zoom lens group and focus compensation lens group in an in-focus state in correspondence with an object distance, and which stores a program for moving said zoom lens group and focus compensation lens group to trace the locus stored in said storage means upon zooming, said program including:

- a selection routine for selecting the locus on the basis of positions of said zoom lens group and focus compensation lens group;

- a detection routine for detecting an in-focus level; and

- a control routine for determining a moving amount of said focus compensation lens group on the basis of the selected locus information, the in-focus level detected in the detection routine upon zooming, and a moving speed of said zoom lens group.

Claim 63 (Original): The medium according to claim 62, wherein the control routine includes a routine for controlling the moving amount of said focus compensation lens to be inversely proportional to the in-focus level and the moving speed of said zoom lens group.

Claim 64 (Original): The medium according to claim 62, wherein the control routine includes a routine for selecting a new locus from the locus selected in the selection routine by calculation processing.

01  
Cont

Claim 65 (Original): The medium according to claim 62, wherein the control routine has a storage routine for storing the moving amount of the focus compensation lens group corresponding to the in-focus level and the moving speed of said zoom lens group as information for selecting a new locus.

Claim 66 (Original): The medium according to claim 62, wherein the control routine includes a routine for selecting a new locus to change the moving amount of said focus compensation lens group stepwise in correspondence with the in-focus level and the moving speed of said zoom lens group.

Claim 67 (Original): The medium according to claim 62, wherein the control routine includes a routine for selecting a new locus to change the moving amount of said focus compensation lens group continuously in correspondence with the in-focus level and the moving speed of said zoom lens group.

Claim 68 (Original): The medium according to claim 62, wherein said lens system comprises an exchangeable lens system, and the detection routine and control routine are executed by said exchangeable lens system.

Claim 69 (Original): The medium according to claim 62, wherein said lens system comprises an exchangeable lens system, and the detection routine and control routine are executed by an imaging apparatus main body.

Claim 70 (Original): A lens control apparatus comprising:

a zoom lens;

a focus lens having a function of correcting a change in focal plane position upon movement of said zoom lens;

storage means for storing a locus representing a positional relationship between said zoom lens and focus lens in an in-focus state in correspondence with an object distance;

detection means for detecting an in-focus level;

selection means for selecting the locus on the basis of position information of said zoom lens and focus lens; and

control means for calculating a moving amount of said focus lens to move said focus lens according to the locus on the basis of the locus information selected by said selection means and the in-focus level detected by said detection means, and changing the moving amount of said focus lens in correspondence with a moving speed of said zoom lens.

Claim 71 (Original): The apparatus according to claim 70, wherein said control means changes the moving amount of said focus lens in correspondence with the moving speed of said zoom lens, and controls to decrease the moving amount of said focus lens as the moving speed of said zoom lens is higher.

Claim 72 (Original): The apparatus according to claim 70, wherein said control means controls to increase the moving amount of said focus lens as the in-focus level

detected by said detection means is lower, and to decrease the moving amount of said focus lens as the moving speed of said zoom lens is higher.

*C1*  
*Correct*  
Claim 73 (Original): A lens control apparatus comprising:

a zoom lens;

a focus lens having a function of correcting a change in focal plane position upon movement of said zoom lens;

storage means for storing a locus representing a positional relationship between said zoom lens and focus lens in an in-focus state in correspondence with an object distance;

detection means for detecting an in-focus level; and

control means for selecting the locus in accordance with position information of said zoom lens and focus lens, the in-focus level detected by said detection means, and a moving speed of said zoom lens, and controlling a moving amount which makes said focus lens trace the locus.

Claim 74 (Original): The apparatus according to claim 73, wherein said control means changes the moving amount of said focus lens in correspondence with the moving speed of said zoom lens, and controls to decrease the moving amount of said focus lens as the moving speed of said zoom lens is higher.

Claim 75 (Original): The apparatus according to claim 73, wherein said control means controls to increase the moving amount of said focus lens as the in-focus level



*Cl  
usual*

detected by said detection means is lower, and to decrease the moving amount of said  
focus lens as the moving speed of said zoom lens is higher.

---